

Name: _____

Date: _____

PC: Even and Odd Functions

Let f be a function.

f is even if $f(-x) = f(x)$ for all x in the domain of f

f is odd if $f(-x) = -f(x)$ for all x in the domain of f

The graph of an even function is symmetric with respect to the y -axis.

The graph of an odd function is symmetric with respect to the origin.

Examples:

Determine whether the functions are even, odd, or neither even nor odd.

1. $f(x) = x^5 + x$

2. $g(x) = 1 - x^4$

3. $h(x) = 2x - x^2$

4. $f(x) = 3x^3 + 2x^2 + 1$

5. $g(x) = x + \frac{1}{x}$

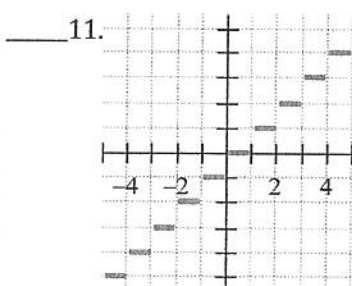
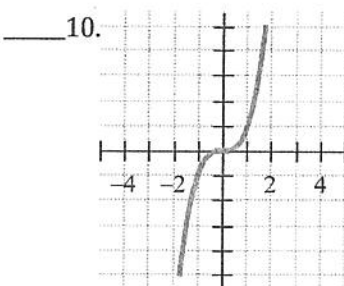
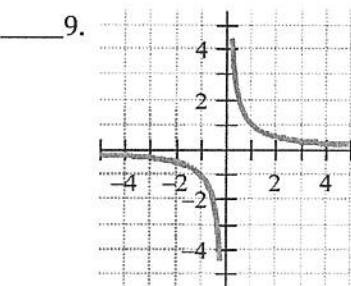
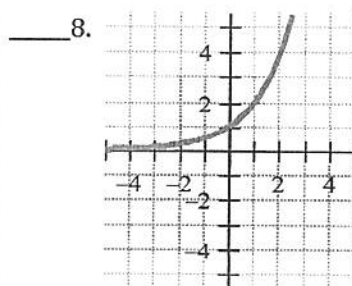
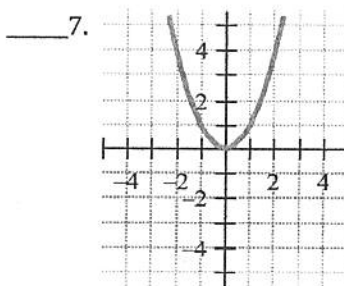
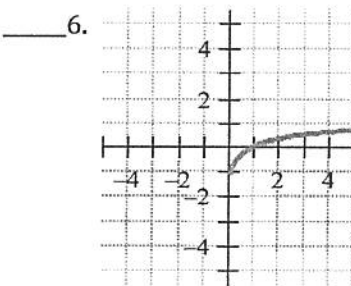
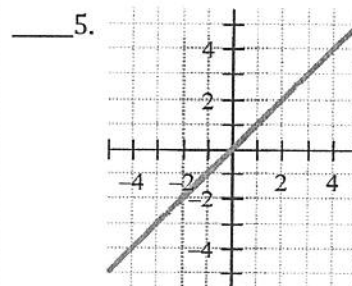
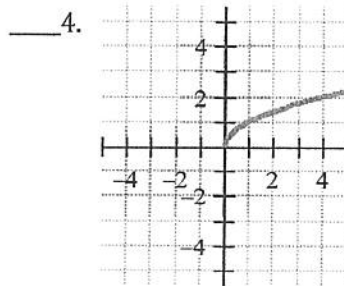
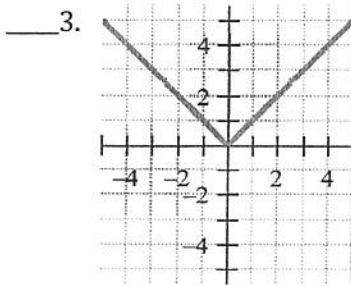
6. $h(x) = x^4 - 4x^2$

Exercises

1. If a function is even, its graph is symmetric with respect to the _____.
This also means that $f(-x) =$ _____

2. If a function is odd, its graph is symmetric with respect to the _____.
This also means that $f(-x) =$ _____

Determine whether each function graphed is even, odd, or neither



Determine algebraically whether each of the following functions is even, odd or neither.

12. $f(x) = 4x + 5$

13. $f(x) = x^3 - x$

$$14. f(x) = x^2 - 6$$

$$15. f(x) = x^3 - x - 2$$

$$16. f(x) = \frac{x^4 - x}{x^5 - x}$$

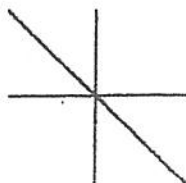
$$17. f(x) = \frac{x^3 - x}{x^5}$$

$$18. f(x) = (x - 4)^2$$

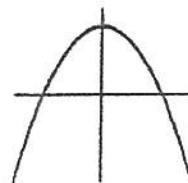
$$19. f(x) = x^4 - x^2 + 4$$

More Practice

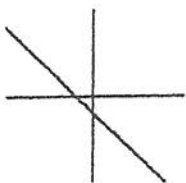
1. Indicate which of the following functions are even, which are odd, and which are neither.



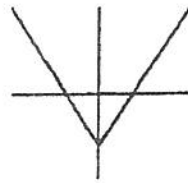
Graph (a)



Graph (b)



Graph (c)



Graph (d)

2. Algebraically, determine whether each function is odd, even, or neither.

a) $f(x) = 3x^4 - 5x^2 + 17$

b) $f(x) = |x|$

c) $f(x) = 12x^7 + 6x^3 - 2x$

d) $f(x) = 4x^3 - 7$

e) $f(x) = x^2 + 2x + 2$

f) $f(x) = \frac{x^2 - 5}{2x^3 + x}$